

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **28 OCTOBER 2005 (28.10.2005)**

Applicant's or agent's file reference

FLGE-P05-002

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/KR2005/002368

International filing date (day/month/year)

21 JULY 2005 (21.07.2005)

Priority date (day/month/year)

17 DECEMBER 2004 (17.12.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC7 H01L 33/00

Applicant

LG INNOTEK CO., LTD et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application


2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR

 Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon
302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Date of completion of this opinion

28 OCTOBER 2005 (28.10.2005)

Authorized officer

YOU, Hwan Cheol

Telephone No. 82-42-481-5741

**WRITTEN OPINION OF THE
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Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ on paper
☐ in electronic form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in electronic form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-39	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-39	NO
Industrial applicability (IA)	Claims	1-39	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following document:

D1: JP 08-008463 A

D2: JP2004-311791A

D3: JP10-012927A

I. Novelty

The claims 1-39 of the present invention seem to be novel(Article 33(2) PCT) because the subject matter of the present claims 1-39 differs from an LED package in D1, D2, D3 respectively.

II Inventive step

The present invention relates to an apparatus for an LED package for improving heat-dissipating capability and controlling light-emission easily including a metal PCB.

Claims 1-18

The subject matter of claims 1-18 relate to a LED package , wherein LED chip is mounted on a insulating layer-open space of a metal base with heat sink and then is connected to circuit layer by wire bonding.

D1(JP 08-008463 A) relates to a thin type LED dot matrix unit enabling to achieve high definition and to improving the heat radiating efficiency of LED chips, which are respectively fixed to a first metallic layer in the through holes of a insulating substrate and then are connected to a circuit layers provided on the front side of the insulating substrate by metallic fine wires

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

-continued from Box V

D2(JP2004-311791A) relates to lighting device including a LED element for dissipating heat efficiently from an LED chip to a heat dissipating element through a simple arrangement. The LED chip is bonded to a wiring pattern on the shallow recess of a substrate with heat sink by a connecting wire. A heat dissipating element is bonded directly to the surface of the ceramic substrate 21 on the side opposite to the light emitting surface side.

In the view of the teachings of citations D1, D2 taken in combination, these citations disclose all the features of the present claims 1-18, 20. The combination of D1 and D2 discloses the fact that LED chip is mounted on a insulating layer-open space of a metal base with heat sink and then is connected to circuit layer by wire bonding in LED package. Therefore, the present claims 1-18 do not involve an inventive step in the sense of Article 33(3) PCT.

Claims 19-39

The subject-matter of the present claims 19-39 relate to a LED package, wherein LED chip is mounted on a recess space of a metal base with heat sink and then is connected to circuit layer by wire bonding.

D3(JP10-012927A) relates to LED device for dissipating heat efficiently. LED chips are mounted on a recess of a metal base board wherein each chip is applied with a corresponding lens mold thus constituting an LED emitter.

D2 relates to LED device for dissipating heat efficiently, which includes LED chips mounted on a recess of a substrate with a heat sink.

In the view of the teachings of citations D3, D2 taken in combination, these citations disclose all the features of the present claims 19, 21-39. The combination of D3 and D2 discloses the fact that LED chip is mounted on a recess space of a metal base and then is connected to circuit layer by wire bonding in LED package. Therefore, the present claims 19-39 do not involve an inventive step in the sense of Article 33(3) PCT.

III Industrial applicability

The industrial applicability of the present claim 1-39 is self-evident in the sense of Article 33(4) PCT.

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